5.0 GOALS AND DECISIONS

Setting realistic and measurable goals is key to the successful implementation of the WMP. A goal is the desired change or outcome as a result of the watershed planning effort. Depending on the magnitude of the problem, goals may be general, specific, long-term, or short-term. The goals in this WMP focus on improving water quality through the implementation of a variety of management measures.

5.1 GOALS

The Lower Fall Creek Watershed Steering Committee agreed to focus on three pollutants throughout the identification of Critical Areas, development of proposed management measures, and the development of goals and decisions to improve water quality. Those pollutants are sediment, excess nutrients, and pathogens. A goal for public education and outreach is also included as this is an important part of the planning or implementation of this WMP.

Sediment

- Problem: Macroinvertebrate and habitat assessment scores at 17 of 28 (60%) of the sites assessed scored under 60 on the CQHEI or QHEI indices.

- Goal: Reduce sediment delivery to waterbodies within the Lower Fall Creek Watershed.

- Target: To achieve CQHEI or QHEI scores above 60 and improved habitat assessments at all sampling locations throughout the watershed in 10 years.

Nutrients

- Problem: Phosphorus concentrations within the Lower Fall Creek Watershed routinely exceed the EPA recommended threshold of 0.076 mg/L.

- Goal: Reduce excess nutrient loadings to waterbodies within the Lower Fall Creek Watershed.

- Target: To reduce phosphorus concentrations to at or below the EPA recommended threshold of 0.076 mg/L within 25 years. Phosphorus concentrations in many of the water quality samples have been below the detection limits of laboratory equipment utilized to analyze water quality samples (0.19 mg/L). For this reason, a recommended threshold lower than Indiana's draft benchmark of 0.30 mg/L was selected.

Pathogens

- Problem: E. coli concentrations within the Lower Fall Creek Watershed routinely exceed the State of Indiana's Water Quality Standard for a single sample daily maximum of 235 CFU per 100 milliliters or the 5 day geometric mean of 125 CFU per 100 milliliters.

- Goal: Reduce pathogen loadings to waterbodies within the Lower Fall Creek Watershed.

- Target: To reduce E. coli loadings to levels indicated in the Fall Creek TMDL (52% reduction of E. coli loadings upstream of CSO area and 99.5% reduction of E. coli loadings downstream of CSO area) within 25 years.

Education and Outreach

- Problem: It is difficult to indicate the successes of public education and outreach efforts such as media releases, workshops, and brochures designed to raise awareness, change behaviors, and have a positive impact on water quality.

- Goal: Increase watershed related public education and outreach efforts within the Lower Fall Creek Watershed.

- Target: Utilize social indicator survey results to prepare future public education and outreach efforts for use in implementation of the proposed management measures and to assist with other outreach efforts such as MS4 Phase I and Phase II Public Education/Public Involvement, SWCD educational materials, and the larger 8-digit HUC Upper White River Watershed Alliance (UWRWA) on at least an annual basis.

5.2 DECISIONS

Throughout Steering Committee meetings, Work Group meetings, and with input from stakeholders, potential management measures were identified and recorded. During the May 13, 2008 Steering Committee members were invited to discuss, wordsmith, combine, and delete the list of potential management measures. Once the measures were agreed upon, the Steering Committee identified responsible partners, financial and technical resources, and an estimated timeframe for implementation. The management measures are grouped by goal (sediment, nutrient, pathogen, and education) in **Table 5-1** through **Table 5-4**.

Figure 3-4 was utilized with tables 5-1 through 5-4 to determine areas where proposed management measures could be targeted with beneficial impacts to water quality or where BMPs could be installed as demonstrational practices in highly visible or utilized areas throughout the watershed.

Table 5-1: Sediment Management Measures

Management Measures	Responsible / Partnering Entity	Financial / Technical Assistance Needed	Timeline for Implementation	Milestones for Implementation
Educate contractors and developers regarding Rule 5 & Rule 13 requirements, inspections, and enforcement. *Where:* • *City of Lawrence due to high percentage of HEL or PHEL classified soils* • *Town of Fishers, City of Noblesville, and Town of McCordsville as areas under development pressure*	IDEM Hoosier Heartland Resource, Conservation, & Development (HHRCD) MS4 Communities *All* SWCDs *All* Building Association of Greater Indianapolis (BAGI)	• Educational materials (IDEM, EPA) • List of contractors and developers to invite • List of construction sites for field exercise • Feedback mechanism to improve on annual training • Rule 5 & Rule 13 program expertise • Inspection forms • List of local, state, federal penalties for non-compliance • Training materials • *$3,500 per full day training*	5 years	1. Build partnerships with HHRCD, MS4s SWCD, BAGI, etc. 2. Develop training module (field and classroom) materials 3. Conduct annual pre-construction season training
Stabilize streambanks within the watershed with native vegetation (target adjacent publicly owned open spaces and golf courses), removing invasive species if present. *Where:* • *Public areas where access and willingness may be higher* • *Commonwealth Biomonitoring Site #6* • *IUPUI Assessment sites based on feasibility and cost/benefit* ***Estimated Load Reductions:*** *Utilizing STEPL: 300 linear feet, 15 feet height Severe lateral recession (0.3-0.5 ft/year), Clay soil* *Pre stabilization = 63.0 tons/year sediment load* *Post stabilization = 3.2 tons/year sediment load* *Reduction = 59.8 tons/year sediment* *(Also includes 110 lb/yr Nitrogen; 42 lb/yr Phosphorus; and 220 lb/yr BOD*	Parks Departments *All* Golf Course Managers Keep Indianapolis Beautiful (KIB) SWCDs *Hamilton County* *Marion County*	• GIS for mapping and prioritization • Detailed topography for design • Engineer to model stream and design stabilization alternatives • Invasive species field guide and hand tools • Volunteers • Contractors and equipment • Permits writer and fees • Stabilization materials (plants, stone, fabric) • *$200 - $1,000 per linear foot stabilized*	5 years	1. Starting with public owned open space and golf courses, conduct a comprehensive streambank inventory 2. Prioritize areas for stabilization 3. Starting with the high priority sites, develop design alternatives 4. Obtain permits, stabilization materials 5. Schedule construction, coordinate laborers 6. Stabilize streambank according to selected design

Management Measures	Responsible / Partnering Entity	Financial / Technical Assistance Needed	Timeline for Implementation	Milestones for Implementation
Develop a Lake Management Plan for priority lakes *Where:* • *Indian Lake due to observed and experienced problems* • *Other lakes as willing*	HOAs *All* Planning & Zoning Departments *Indianapolis DMD* *Town of Fishers* SWCDs *Marion County* *Hamilton County* Lower Fall Creek Watershed Alliance (LFCWA)	• Model Lake Management Plan • Coordinator (paid or volunteer) • GIS for analysis and exhibits • Existing physical, chemical, biological data • *$5,000 - $30,000 (will vary with size of lake/watershed)*	5-10 years	1. Identify pollutants, sources, and causes (collect data if needed) 2. Work with HOA and DMD to develop Lake Management Plan 3. "Adopt" Lake Management Plan by HOA 4. Work with DMD or Planning and Zoning Department to establish Overlay Zone or amend allowable land uses/densities upstream (if warranted)
Reduce soil erosion and stormwater runoff from construction sites. *Where:* • *Construction sites located on HEL or PHEL classified soils* ***Estimated Load Reductions:*** *[obtaining potential load reductions for construction BMPs]*	MS4 Communities *All* IDEM SWCDs *All* Developers and Contractors	• ESC and SWPP plan reviewers • Inspectors • Checklist for review and inspection • Enforcement support from MS4 and IDEM • Training for developers, contractors, plan reviewers, inspectors • *Cost will be dependent on status of MS4 program and staff availability*	10 years	1. Develop checklist for plan review and inspection 2. Review ESC practices, SWPP, etc for active construction sties 3. Inspect construction site, discuss deficiencies with contractor 4. Enforce penalty in ESC Ordinance for non-compliance
Create a Highly Erodible Land (HEL) Overlay Zone for planning & zoning purposes. *Where:* • *Throughout Lower Fall Creek Watershed*	Planning & Zoning Departments *All* SWCDs *All* Lower Fall Creek Watershed Alliance (LFCWA)	• GIS for mapping and analysis • NRCS Soil Data • Model HEL Ordinance • Legal to review Ordinance • HEL literature • *No direct cost if development of overlay is completed by Planning & Zoning Departments*	5-10 years	1. Draft language for HEL Overlay Zone. 2. Create HEL maps. 3. Build support with decision-makers. 4. Adopt HEL Overlay Zone into Development Ordinance.

Management Measures	Responsible / Partnering Entity	Financial / Technical Assistance Needed	Timeline for Implementation	Milestones for Implementation
Establish signage program to identify active construction sites or developers that are in compliance with IDEM's Rule 5 program. *Where:* • *City of Indianapolis as the largest community* • *Town of Fishers, City of Noblesville, Town of McCordsville due to development pressure*	Planning & Zoning Departments *All* SWCDs *All* LFCWA	• Examples elsewhere • Inspectors (trained) • Yard signs • GIS for tracking • *$300 per sign*	25 years	1. Establish criteria 2. Build support among decision-makers and contractors 3. Develop signs, inspection forms, tracking 4. Train inspectors 5. Inspect sites, install yard signs
Partner with County SWCD and NRCS to identify lands non eligible for CRP, EQIP or other federal programs and work with landowners to implement BMPs such as conversion to conservation tillage or establishment of filter strips. *Where:* • *Agricultural lands within Hamilton, Hancock, and Madison Counties*	SWCDs *All* NRCS *All* LFCWA	• GIS for mapping and analysis • NRCS eligibility guidelines • Staff for site visits to discuss program with landowners • *Existing staff time*	5 years	1. Meet with NRCS and SWCD representatives to determine areas in agricultural production. 2. Highlight areas not eligible for federal programs 3. Meet with landowners within the watershed to discuss their long-term goals for the land 4. Implement or install appropriate BMPs

Table 5-2: Nutrient Management Measures

Management Measures	Responsible / Partnering Entity	Financial / Technical Assistance Needed	Timeline for Implementation	Milestones for Implementation
Evaluate Development Ordinances based on the Center for Watershed Protection's "Code & Ordinance Worksheet Tool". *Where:* • *City of Indianapolis, City of Lawrence due to locations within WFPAs*	Planning & Zoning Departments *All* Upper White River Watershed Alliance (UWRWA) Ball State or IUPUI School of Planning	• Code & Ordinance Worksheet tool • Local Ordinances • Planning Students • Legal to review amended language • Support of decision-makers to adopt changes (if needed) • *Existing staff time*	5 years	1. Secure assistance of planning student(s) 2. Review Code & Ordinance Worksheet 3. Modify Worksheet (if needed) 4. Review Ordinances, meet with local planning for clarification (if needed) 5. Draft recommendations 6. Amend Ordinances
Prepare a Wellfield Protection Ordinance for the Madison County WFPA. *Where:* • *Madison County*	Health Departments *Madison County* Planning & Zoning Departments *Madison County*	• Model Wellfield Protection Ordinance • Legal to review Ordinance • GIS to map WFPA and Overlay Zone • *Existing staff time*	5-10 years	1. Review model Ordinance 2. Modify language to meet needs of Madison County 3. Build support among decision-makers 4. Adopt ordinance, create Overlay Zone
Encourage golf courses along Fall Creek and lakes larger than 50 acres to participate in the Audubon Cooperative Sanctuary Program, Groundwater Guardian Green Sites, National Wildlife Federation, or a similar conservation program. *Where:* • *Golf Courses and lakes located within WFPAs*	Golf Course Managers Marion County Wellfield Education Corporation (MCWEC) Office Indiana State Chemist (OISC) HOAs, Neighborhood Associations *Lake 50+ acres* *Adjacent to Fall Creek*	• Program information • GIS for targeting and tracking • Educational materials • Expertise to assist with program requirements and annual reporting (if needed) • *Existing staff time*	10 years	1. Review program materials 2. Identify target areas within focus group 3. Develop educational materials (if needed) 4. Conduct meetings with targeted Golf Course Managers, HOAs, and Neighborhood Associations 5. Assist with program requirements and annual reporting (if needed)
Integrate Low Impact Development (LID) practices into new or re-development projects. *Where:* • *(re)developments within WFPAs if appropriate* • *(Re)developments adjacent to streams and tributaries* ***Estimated Load Reductions:*** *Indiana Stormwater Quality Manual suggests the following potential removal rates:* *Infiltration Trench: 90% TSS, Bacteria and Metals; 60% Phosphorus and Nitrogen* *Bio-retention area: 90% TSS, Bacteria, and Metals; 60% Phosphorus and Nitrogen* *Stormwater Wetland: 67% TSS; 77% bacteria; 30-60% metals; 50% Phosphorus; and 28% Nitrogen*	Developers Planning & Zoning Departments *All* SWCDs *All* HHRCD MCWEC UWRWA Water Utilities	• LID factsheets and guidance • Specific on BMPs (infiltration rates, sizing, design details, etc.) • Model Ordinance • Legal to review Ordinance language • Incentives Programs • LID training (design, construction, maintenance) • *$500 - $10,000 (will vary with practice and size requirements)*	25 years	1. Research LID practices 2. Identify BMPs suitable for soils, climate, etc. 3. Develop design/technical standards 4. Integrate language from Model Ordinance into local Ordinance 5. Establish incentives 6. Build support of decision-makers, developers, and contractors 7. Train plan reviewers and inspectors 8. Amend Ordinance

Table 5-3: Pathogen Management Measures

Management Measures	Responsible / Partnering Entity	Financial / Technical Assistance Needed	Timeline for Implementation	Milestones for Implementation
Establish or enhance shoreline and streambank riparian buffers to reduce potential increases in bacteriological impacts from wildlife and domestic pets throughout the Lower Fall Creek Watershed. *Where:* • *Areas of (re)development where stormwater ponds are present* • *Priority lakes* • *Golf Courses* ***Estimated Load Reductions:*** *Studies indicate that approximately 80% of E. coli in stormwater runoff can be removed through a 100 foot vegetated filter strip.*	Health Departments *All* Planning & Zoning Departments *All*	• Educational materials • GIS to map and track progress • Model Ordinance language (vegetation mowed to 12 inches max) • Educational signage • Trees, shrubs, herbaceous plants for buffer • *$50 - $2,000 per acre established*	5 years	1. Identify and prioritize target areas 2. Review Model Ordinances and other resources 3. Draft Ordinance language for maintenance adjacent to waterbodies 4. Build support decision-makers, HOAs 5. Enhance shoreline/streambank 6. Install educational signage
Partner with the Indiana State Fair Board to reduce *E. coli* loadings to Fall Creek. *Where:* • *Indiana State Fairgrounds*	4-H / Future Farmers of America (FFA) Fair Board Fair Commission Health Departments *Marion County* Mapleton - Fall Creek Neighborhood Association	• Engineer to model stormwater runoff, design alternatives • Water quality data • “Pathway to Water Quality” materials • Construction equipment, materials for demonstration project • *Cost will vary with BMP alternative*	5-10 years	1. Confirm source of E.coli loadings 2. Research and prioritize alternatives 3. Build support of decision-makers 4. Construct demonstration project and outdoor laboratory to monitor changes in water quality 5. Enhance “Pathway to Water Quality”
Partner with County SWCD and NRCS to identify lands non eligible for CRP, EQIP or other federal programs and work with landowners to implement BMPs such as nutrient management or establishment of filter strips. *Where:* • *Agricultural lands within Hamilton, Hancock, and Madison Counties*	SWCDs *All* NRCS *All* LFCWA	• GIS for mapping and analysis • NRCS eligibility guidelines • Staff for site visits to discuss program with landowners • *Existing staff time*	5 years	1. Meet with NRCS and SWCD representatives to determine areas in agricultural production. 2. Highlight areas not eligible for federal programs 3. Meet with landowners within the watershed to discuss their long-term goals for the land 4. Implement or install appropriate BMPs

Support the Septic Tank Elimination Program (STEP) especially within the WFPAs and floodplains of the Lower Fall Creek Watershed.	Health Departments *Marion County* Indianapolis DPW Health & Hospital Corporation *Marion County* HOAs, Neighborhood Associations *High, Medium, Low Priority*	• STEP literature • Septic maintenance information • GIS to map individual septic systems • Water quality data • Grant writing and administration • *Existing staff time*	10-25 years	1. Identify septic systems in WFPAs 2. Target these areas for connection to sewers 3. Distribute literature to HOA 4. Prepare grants to assist homeowners with connection fees
Provide education and outreach to areas outside of Marion County that with anticipated inadequately functioning septic systems or illicit storm sewer connections.	Health Departments *All* Indiana State Department of Health LFCWA	• Existing septic system literature • Septic maintenance information • GIS to map individual septic systems • Water quality data • Hamilton South Eastern sewer service areas • Grant writing and administration	10-25 years	1. Gather and distribute existing literature to provide to homeowners 2. Obtain sanitary sewer service coverage layers from Hamilton South Eastern Utility

Table 5-4: Education Management Measures

Management Measures	Responsible / Partnering Entity	Financial / Technical Assistance Needed	Timeline for Implementation	Milestones for Implementation
Create education demonstration project(s) to illustrate good urban development or redevelopment practices and good stormwater management in critical watershed areas. **Appendix 6** includes a BMP Demonstration Report prepared as part of this WMP. *Where:* • *WFPAs* • *Areas of HEL or PHEL classified soils*	MS4 Communities *All* Planning & Zoning Departments *All* HOAs *All* Community Development Corporations (CDCs) *All*	• BMP Demonstration Report • Willing landowner, developer, contractor • Technical assistance for design, construction, and maintenance • Stormwater management literature • Engineer to design BMP • Permits writer and fees (if needed) • BMP materials • Construction equipment and laborers	5 years	1. Prioritize demonstration site using BMP Demonstration Report research 2. Identify landowner and willingness to participate 3. Conduct site inventory and analysis and determine suitability, identify stormwater practice to implement 4. Design and construct BMP 5. Monitor and document long-term effectiveness
Develop future education & outreach programs based on results of the Social Indicators Survey. *Where:* • *Areas will be dependent on survey results*	LFCWA Purdue University	• Survey results (Purdue interpretation) • Education materials, programs, etc. (depending on survey results) • Follow-up survey • *2nd survey to be completed by Purdue* • *Existing staff time*	5-10 years	1. Conduct survey, compile results 2. Identify target areas and message for education and outreach 3. Develop and distribute materials (format depending on survey results) 4. Develop follow-up survey (with Purdue)
Host an annual "Watershed Awareness" or "Celebrate Fall Creek" event (stream clean-up, water quality monitoring, educational workshops, safety, health and wellness). *Where:* • *Along Fall Creek in an Indy Park for accessibility and visibility*	LFCWA Natural Resources Education Council Parks & Recreation *All* UWRWA Health Departments *All* Fort Benjamin Harrison State Park MS4 Communities *All*	• Marketing expertise • Social Indicator Survey results (identify target audience, target message) • Event planner • Media coverage • *Cost will vary based on partnership and contributions*	5-10 years	1. Partner and coordinate with similar entities 2. Identify target stakeholders (Social Indicators Survey) and tailor event to attract them 3. Identify high profile work project to be the focus of event

Evaluate land use planning strategies based on the Center for Watershed Protection's "Managing Stormwater in Your Community". *Where:* • *City of Indianapolis, City of Lawrence due to locations within WFPAs* • *Communities along 303(d) listed streams* • *Areas of localized flooding per MHMPs, FRP, or Mayor's Action Center*	Planning & Zoning Departments *All* Upper White River Watershed Alliance (UWRWA) Ball State or IUPUI School of Planning	• CWP document • Local Ordinances • Planning Students • Legal to review amended language • Support of decision-makers to adopt changes (if needed) • *Existing staff time*	5 years	1. Secure assistance of planning student(s) 2. Review Managing Stormwater in Your Community 3. Review planning strategies, meet with local planning for clarification (if needed) 4. Draft recommendations 5. Amend Land Use Plan
Obtain funding for Urban Conservationist position within the Marion County SWCD *Where:* • *Marion County SWCD (or partnering organization such as Hoosier Heartland RC&D)*	Marion County SWCD Hoosier Heartland RC&D NRCS	• New employee with conservation and/or urban conservation experience • Office space and appropriate equipment (computer, GIS, etc.) • *Approximately $40,000 per annum*	5 years	1. Secure funding through grants or special partnership with another organization. 2. Interview potential hires 3. Utilize Lower Fall Creek WMP to implement management measures 4. Provide education and outreach to targeted audiences regarding urban conservation measures and outcomes.